



Key Considerations from Primer

The program must play an essential role to report on this measure. An essential role is one that would be described by stakeholders and partners as essential for the project's ultimate success.

When a program has a non-essential role, describe the the project's impacts or accomplishments in narrative form for the annual report but do not include these the performance measures and metrics.

- ▶ Not everything needs a number
- ▶ Count what you can count
- ▶ Sometimes a story is best
- ▶ If it's too complicated, report it as an Impact or Accomplishment
- ▶ Do not seek out nor shy away from large numbers. Larger benefits are ok but should be reviewed with added rigor
- ▶ Do not use multipliers
- ▶ Include citations in reporting to enhance clarity, defensibility, and transparency.

Ecosystem Service Valuation¹

"Ecosystem services" represent the human benefits that healthy ecosystems (e.g., mangroves, wetlands, dunes, coral reefs, oyster beds) provide, including water purification, flood protection, enhanced fisheries, carbon sequestration, and improved tourism and recreational opportunities. Sea Grant programs are actively involved in protecting, enhancing, and restoring our nation's ecosystems. These programs currently track the number of acres they help preserve or restore in Sea Grant's Planning, Implementation, and Evaluation Resources (PIER)² database. This methodology guide provides a basic approach to ecosystem service valuation (ESV) using a benefit transfer methodology, but it also acknowledges that implementing these complex questions often requires the assistance of an economist. Please see the "Key Steps and Best Practices" section of this guide for more information.

Examples

Here are some slightly modified examples of how Sea Grant programs have reported ESV benefits to Sea Grant's Planning, Implementation, and Evaluation Resources (PIER)² database. For each example, we provide our thoughts on what the Sea Grant program did well and what could be improved.

- 1** A Sea Grant extension specialist runs the Master Naturalist Program. Through that work, a participant decided to conserve 20 acres of mixed forest. This publication [publication was cited] shows a value of \$880/acre/year for conserved mixed forest. Using these numbers, the value of the Master Naturalist's 20-acre conservation easement was $\$880 * 20 = \$17,600$
 - ✔ Sea Grant clearly documented the ESV calculation and numbers. The citation helps with defensibility.
 - ✘ Sea Grant would improve the story by explaining how protecting the forest leads to a benefit (e.g., improved water quality, recreation benefits) and showing that this is the same type of benefit captured in the cited publication. Additionally, Sea Grant would strengthen the approach by citing the geographic region and showing that it accounted for any differences between the study region and the Sea Grant geographic region.
- 2** A Sea Grant extension specialist helped significantly improve 11 miles of stream. This improvement affected an estimated 100 feet on either side of the stream (200 feet total). That is $11 \text{ miles} * 5,280 \text{ feet/mile} * 200 \text{ feet} = 11,616,000 \text{ square feet}$, or approximately 267 acres impacted. The value of "habitat and refugia" in estuaries is \$192/acre, resulting in a total improvement value of $267 * 192 = \$51,264$.
 - ✔ Sea Grant documented the acreage impacted well.
 - ✘ It is critical to add a citation for defensibility and document how the cited study's ESV translates to the improved stream. It is also important to indicate what the specialist did to improve the stream and to describe the improved stream's benefits (e.g., cleaner water, recreation).

1. This methodology guide was developed to help Sea Grant and other coastal engagement programs calculate and characterize the economic benefits and impacts of their program activities. This methodology guide is a tool and does not constitute official guidance from the National Sea Grant Office for reporting economic benefits and impacts.

2. Sea Grant programs use PIER to submit their impacts, accomplishments, performance measures, and metrics to the National Sea Grant Office.



3 Sea Grant supported extension work to coordinate an oyster gardening program that resulted in oyster reef restoration. Replanted oysters were sufficient for restoration of 2.89 acres, valued at \$55,997. This valuation is based on a (author provided) 2012 publication for TNC (dollars rounded) that cites base numbers of about \$8,500/acre for fish enhancement, \$6,430/acre for annual economic benefit, and \$4,150/acre for nitrogen removal, for a total of about \$19,000/acre (in 2010 dollars).

- Sea Grant documented the amount of restoration, showed all the numbers needed for the calculation, and cited the publication.
- It is a little unclear what the \$6,430 annual economic benefit is, which brings up questions about double counting. It is also important to provide more details about what coordinating means, as we need to clearly understand the value Sea Grant is bringing to this project.

Present Your Story as a Value Chain

Value chains illustrate the sequence of events or activities that result in an economic impact or benefit. Consider developing a value chain diagram to help you tell a compelling and defensible story about how your Sea Grant program, product, or service generated a measurable result.



Let's use one of the earlier examples to illustrate how to create a value chain. *An extension specialist runs the Master Naturalist Program [the program/product/service] and helped conserve mixed forest [what was affected] because a participant was inspired to do so after attending the naturalist program [what was done to get impact]. This program helped conserve 20 acres of mixed forest [measurable change], which provides a \$17,600 annual ecosystem service benefit in enhanced hunting and other recreation [societal benefit] (based on a publication stating an \$880/acre/year benefit for conserved mixed forest) [cite data for defensibility].*



Recommended Methodology and Best Practices

Recommended Methodology: Benefit transfer

Description: Benefit transfer is the process of finding values from previous studies for areas with similar ecosystem functions and benefits and applying those values to your area. Primary data collection efforts (e.g., a field survey focused on the ecosystem service benefit of interest) provide the most defensible method, but they are resource-intensive and time-consuming. Conversely, benefit transfer studies can be a reasonable and cost-effective approach. This methodology is not perfect and requires professional economic judgment on the validity and applicability of other studies. To minimize errors, you should look for estimated benefit values from similar geographies, ecosystem functions, and/or types of land use development. We also recommend using ESVs from more recent studies (ideally after 2000).

Key Steps and Best Practices:

1. Obtain economic expertise. Consider a principal investigator with ESV expertise from a Sea-Grant-affiliated University, graduate environmental economics students from a Sea-Grant-affiliated university, or contractors with ESV expertise.
2. Develop a narrative that links the restoration efforts to economic benefits, **using the value chain above**.
3. Identify relevant values to use for the ESV. See the “Tools for Implementation” below.
4. Identify the units needed for estimates, and select units (e.g., \$/acre/year, \$/visitor) that can be applied.
 - Be cautious about using high values. Ecosystems can provide large benefits in a specific study area that might not translate to your area. Rely on economic expertise, especially when you want to use values over \$200/day/person for recreation benefits or over \$2,000/acre for other benefits.
 - Ensure the values you are estimating and the study you are referring to have comparable geographies, benefits, and time periods. You may need to adjust for any differences with the help of an economist.
 - Consider using an average value from multiple studies, if possible.
 - Unfortunately, you cannot use this method if there are no transferable values from other studies. You should instead describe your benefits qualitatively in an impact or accomplishment statement.
 - Be careful about using values from post-disaster restoration studies. These values may reflect an increased willingness to pay for benefits such as coastal armoring immediately after a disaster.
5. Calculate the ESVs. Calculate benefits over a timeframe representative of how long the benefits will continue to occur.
6. Identify the benefits that cannot be assigned a value and describe them qualitatively.
7. Step back and assess validity—does this pass an “eyeball test”? That is, are the estimated values plausible and consistent with other similar studies? An economist can help here. Use words like “potential” or “approximate” to underscore that all economic studies have levels of uncertainty attached, and benefit transfer studies tend to have greater uncertainties than methods that use primary data.
8. Add up benefits where possible, but be careful not to double count the same benefit. For example, it would be double counting to add up the value of the willingness to pay for cleaner water in an estuary and the value of recreation, as the cleaner water may already be part of why someone would pay more for recreation.



Factors to Consider in Communicating Benefits

You should consider the following differences when reporting your economic impact or benefit to Sea Grant’s PIER database versus communicating its value in other outreach pieces (e.g., fact sheets, websites, impact statements, accomplishment statements).

	Performance Measure Reporting in PIER	Impact Statements and Other Outreach
Recurring Benefits	Report the benefit for one year to tie funding to benefits for specific years.	Continue to count and communicate recurring benefits from past projects if you can confirm the benefits are still occurring.
Attribution	Avoid double counting when multiple Sea Grant Programs are involved . Multiply the final \$value by the fraction of your level of effort (LOE) divided by total Sea Grant LOE (e.g., you provided 400 hours, Sea Grant program 2 provided 600 hours, and another organization provided 500 hours). Multiply the final \$value by 40% (i.e., your 400 hours / 1,000 total Sea Grant hours [600 + 400]). The other Sea Grant program will multiply by 60%. Together, the two Sea Grant programs are now claiming they were essential contributors to the full \$value (without double counting). Note, the Sea Grant programs are claiming they were an essential contributor to the full value, but not the only contributors to this full value.	There is generally no need to attribute the value of your contribution; simply state you played an essential role in a project that provided \$X in ESVs and ensure your role is transparent and well-described to tell an effective story. If you need to attribute your LOE for outreach, use your percent LOE as a rough estimate (e.g., Sea Grant contributed 300 hours out of a total 1,000 hours, so it contributed 30 percent).
Very Large Benefits	Ensure an economist thoroughly reviews your ESVs to ensure that your project’s benefits align with those from the study or studies from which you are transferring the benefit.	See box for PIER to the left. Additionally, if you can qualify your numbers, use ranges and terms like “approximately.”

Tools for Implementation

The following databases provide searchable user interfaces to identify studies to use in benefit transfer. While there is some overlap in the studies across the databases, all three databases can be excellent sources for finding studies relevant to your project. Key features of the databases’ functionality and features are described below:

- [GECOSERV Database \(Harte Institute\)](#): This database is a self-select matrix with 24 ecosystem services and 10 ecosystem types with access to 1,400 ESV estimates. GECOSERV’s advantage is its focus on coastal and ocean ecosystem services.
- [Ecosystem Services Partnership \(ESP\) Database \(UNEP\)](#): The ESP database contains over 1,350 ESV estimates from over 300 case studies that users can select and use as reference points to fit their own ESV needs. This database absorbed several other databases in the last few years and is recognized as a fairly comprehensive database of valuation studies, but it is not limited to coastal studies.
- [Benefit Transfer and Use Estimating Model Toolkit \(Colorado State University\)](#): This toolkit includes spreadsheet models based on meta-analyses that can be used to estimate values in a variety of contexts, as well as average values across studies valuing similar services.

These guides are reference tools only and do not constitute formal performance measure or reporting guidance.

Please contact oar.sg.info-admin@noaa.gov with any reporting questions.